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Urge Reallocation to Basic Science

R&D Spending is Out of Balance, NSF Chiefs Argue

After a few warm-up comments, some remarkably frank official talk about the muddle of national science affairs poured forth at a press conference June 20, following a regular meeting of the National Science Board, policy-making body of the National Science Foundation.

Trying to peer through the mists of Gramm-Rudman, the Board had met for 2 days to contemplate an assortment of long-term budget scenarios, ranging from a standstill at the current \$1.5 billion to hallucinations in the \$3-billion range over the next few years. At the conclusion of the Board's deliberations, reporters were invited to meet with NSF Director Erich Bloch and NSB Chairman Roland W. Schmitt, whose full-time job is GE Senior Vice President for Corporate R&D. Both have been publicly saying over the past year that academic basic science is seriously undersupported and that funds for its expansion should be redeployed from the big "D" in federal R&D. This time they said it more emphatically. Following are excerpts, recorded and edited by SGR.

Q. Is this the opening of a campaign for a \$2- or \$3-billion NSF budget?

Bloch. It's not a campaign for doubling or tripling the NSF budget. We don't have the right balance between the basic research funding and the other R&D activities in the country. That is the campaign. That has something to do with NSF, obviously, but also involves spending by DOD, DOE, and the other agencies. If you lay all of the requirements on the table—undergraduate, new facilities, new equipment, shortage in instru-

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mentation, and so forth—it's very clear that we are not going to solve these problems by the normal marginal increases that we have been getting in the past. It's not a 10-percent kind of a problem anymore. It has gone much further beyond that. But the campaign is not for a doubling. The campaign is to make something right which is out of kilter today, namely, the support of universities and the support of basic research.

Schmitt. [When I was discussing this issue recently] I was asked whether I was talking as Chairman of the National Science Board or as Senior Vice President of R&D for GE. And I said both, because my view of them

is absolutely consistent, from either seat I sit in. The fact is that when I'm up there running the General Electric Laboratory, for the past 3 years, the main limitation that I have faced is an inadequate number of top quality research-grade people. I have had more money than people in each of the last 3 years. The fraction of foreign nationals you find in your laboratories is going up. The fact is that the situation is critical.

Q. Dr. Schmitt, some law firms in New York are responding to their difficult manpower needs by starting out young graduates at \$70,000 a year. Do you see any similar response in the scientific and technical areas?

Schmitt. Salaries of PhD research-grade people have
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In Brief

What's holding up the formal nomination of William R. Graham as the President's Science Adviser? The White House announced on June 3 that Graham, Deputy Director of NASA, would fill the long-vacant advisory post (SGR Vol. XVI, No. 11). But as of June 27, his nomination still hadn't been sent to the Senate, which must confirm the appointment. It's just a paperwork hitch, SGR is told. Meanwhile, Graham hasn't been getting a head start on the workload of the Office of Science and Technology Policy, homebase for the presidential advisory post. "He hasn't been around," says a staff member.

Hugh Loweth, the science man for decades at the Office of Management and Budget (and its predecessor), retired June 30, and NSF's chiefs, among others, are apprehensive about what may come next. Loweth, invisible to the public, and little-known to the scientific community, is credited by insiders as a tough but supportive friend of research programs, as well as being the "institutional memory" for science affairs in an amnesiac government. His successor has not been named.

Pork-Barrel Comeback: The Senate knocked out 10 special appropriations, worth \$80 million, for university facilities on June 6 (SGR Vol. XVI, No. 11). But 9 of them—totaling \$55 million—were restored to the spending bill in a House-Senate conference 2 weeks later. The only casualty was \$25 million for Arizona State University, zapped on a technicality. On June 27, the full Senate accepted restoration of the funds.

NSF's Board: A Rostrum for Pitching for Science

The terms of 8 of the 24 members on the presidentially appointed National Science Board (NSB) expired—according to ancient schedule—on May 10. But as of the end of June, replacements had not been named by the White House, which, despite this neglect, has tolerated a reach for bigger influence by this obscure science-policy body.

The unofficial word is that the names of the new Board members are in the clearance mill and will probably be ready for announcement by the end of the summer. Appointments are for 6 years and one-third of the appointments expire every 2 years. But if the vacancies linger on, surprise is not in order. The White House personnel office does not assign a high priority to the National Science Board.

Time-consuming FBI checks for these minor appointments are considered necessary, but not because the Board deals with secrets. The appointments are officially made by the President and, therefore, serious miscreants must either be screened out or defenses for them must be prepared. The sluggishness was also evident in previous administrations, but it has become chronic under Reagan.

The Board takes itself seriously as the policymaker for NSF, and is duly catered to as such by the NSF staff and Director, who is a member *ex officio*. It currently meets 6 times a year—expanding to 9 next year—which is a heavy schedule for a part-time body composed mainly of senior high achievers busy elsewhere with full-time work.

Despite early fears that creationists and perpetual-motion enthusiasts would capture the Board as seats became vacant under Reagan, the appointments have all been mainly from the respectable mainstream of academe and industry. In its first year, the White House trampled all over NSF, eviscerating its social science programs without consulting the Board. But since then, NSF has become a favorite of some of Reagan's high-tech corporate cronies, and the White House has allowed both the Foundation and the Board to run their own affairs. It is increasingly difficult to distinguish Republicans from Democrats when it comes to spending on science—they're

all for it, enthused by the expectation that research will produce national riches and superior defenses.

The Foundation's chieftains—Erich Bloch, formerly of IBM, and Board Chairman Roland W. Schmitt, a GE Senior Vice President—have turned the Board into a pulpit for sermonizing for more money for basic science in universities and alerting the country to the neglect of science education. These themes were also sounded by the Carter appointee who served as NSB Chairman until 1984, Lewis M. Branscomb, Vice President and Chief Scientist of IBM. A major difference now is that the economic and political atmosphere is more receptive to ominous warnings about the danger of neglecting scientific strength.

Bloch and Schmitt have amplified the scare themes and introduced a proposal that's been around but has never before been so loudly proclaimed: Since budget conditions rule out growth in federal spending, they argue, federal research agencies should redeploy some of their R&D funds to academic basic science. One senses that what they really have in mind is a big chunk of the money that the Pentagon squanders on misconceived and overpriced weapons development—and that they'd like to see that money assigned to NSF. But while not rejecting NSF as the beneficiary of their design, they publicly focus their hopes on more money for university science, regardless of who's handing it out to parched grantees..

Bloch and Schmitt haven't yet sold their scheme to the White House, or the other agencies, but they obviously haven't been told to pipe down.

One advantage they enjoy is the eclipse of the White House Science Office, which has been rudderless since George A. Keyworth II quit on January 1. Keyworth was a big booster of NSF, but, now, with no one in charge of science policy at the White House level, the Board's voice is the only one being sounded on these issues.

While the new appointments to the Board are pending, those whose terms have expired serve in the status of non-voting consultants—a device long ago developed by the Board to cope with these delays.—DSG

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... New Ways of Looking at the Foundation's Budget

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been going up substantially. On that score, the criticism made of industry is that we're offering salaries at such a level that we're causing all those faculty vacancies out there. My response to that is, hey, what do you want me to do about that? That is the problem we're talking about.

Q. Are the Board and the Foundation changing their priorities or their perceptions about what you should be doing?

Schmitt. We're changing our approach to planning, and the budget process, too. One of the things that frustrated me about the budget process when I first came on the Board is that there was always this thing called the "base"—it was a vast, hidden terrain that you never looked at. And that was not a budget process that I was accustomed to. One thing that Erich has certainly done is open that discussion up and cause the directorates [for the disciplines supported by NSF] to say, how would I cut back in some of what I've been doing earlier to make room for new programs?

Q. How are you coming along in penetrating political consciousness with the argument that the present balance between basic research and the rest of the R&D is not a healthy one? You're the only ones making this argument in Washington.

Bloch. Not true. The Packard-Bromley report [by a White House Science Council panel chaired by David Packard and D. Allan Bromley—SGR Vol. XVI, No. 10] made that argument. Some of the Congressional people are picking up the argument. The Academies, Science and Engineering, are making that argument.

Q. The House Science and Technology Committee's Task Force on Science Policy actually got a lot of witnesses up to say that it's not that we're underfunding basic research—perhaps we've even been putting too much into basic research—but we should put more into applied research. Isn't that the problem for economic competitiveness?

Bloch. That a short-term view of the world. The point that we have been making is that if you look at basic research, you really have to ask yourself what has to happen 10 or 20 years from now. What has been decreasing has been basic research as a percentage of the total [support of R&D].

Schmitt. There is no question that there are big deficiencies in the applied research and development activities in the country. In my view, those deficiencies are mainly in industry. What NSF is concerned with is academic research, and to me, it is a vital part of the US system where we have a competitive advantage, if we maintain it and strengthen it. We've got a stronger aca-

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Science Board Membership

The following are members of the National Science Board, and those who have been appointed as consultants, following the expiration of their terms and pending the appointment of new members.

Terms Expiring May 1988:

Warren J. Baker, President, California Polytechnic State University

Robert F. Gilkeson, Chairman Executive Committee, Philadelphia Electric Co.

Charles E. Hess (NSB Vice Chairman), Dean, College of Agriculture and Environmental Sciences, UC Davis

Charles L. Hosler, VP for Research, Graduate Dean, Pennsylvania State University

William F. Miller, President, SRI International

William A. Nierenberg, Director, Scripps Institution of Oceanography, UC San Diego

Norman C. Rasmussen, Professor of Engineering, MIT

Roland W. Schmitt (NSB Chairman), GE Senior VP, Corporate R&D

Terms Expiring May 1990:

Perry L. Adkisson, Deputy Chancellor, Texas A&M University System

Annelise G. Anderson, Senior Research Fellow, Hoover Institution, Stanford University

Craig C. Black, Director, Los Angeles County Museum of Natural History

Rita C. Colwell, VP Academic Affairs, University of Maryland, Adelphi, Md.

Thomas B. Day, President, San Diego State University

James J. Duderstadt, Dean, College of Engineering, University of Michigan

K. June Lindstedt-Siva, Manager, Environmental Sciences, Atlantic Richfield Co.

Simon Ramo, Director, TRW Inc.

Terms Expired May 1986, Now Serving as NSB Consultants:

Jay V. Beck, Professor Emeritus of Microbiology, Brigham Young University

Peter T. Flawn, President Emeritus, University of Texas, Austin

Mary L. Good, President, Engineered Materials Research, Allied-Signal Corp.

Peter D. Lax, Director, Courant Mathematics and Computing Laboratory, NYU

Homer A. Neal, Provost, SUNY Stony Brook

Mary Jane Osborn, Head, Department of Microbiology, University of Connecticut Health Center

Donald B. Rice, President, Rand Corp.

Stuart A. Rice, Professor of Chemistry, University of Chicago.

... Basic Science Competition Coming from Japan

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demic research system, better linked to industry, than anyone else in the world. You can find strong academic research systems elsewhere; you can find fine industry performance elsewhere, like Japan. But nowhere will you find a combination of an absolutely first-class, strong academic research system that has historically had good linkage to industry, even though there's a lot of effort being put into improving that today.

Bloch. People are saying that where we are losing today against the Japanese is in taking the research results and converting them into products. But I think they are looking at the past or the present and not at the future. Japan is mounting a tremendous effort over the next few years to get more into the basic-research area. If we learned something from the Japanese, it is that we

should take them seriously in their plans, because they are great planners and they usually follow through. I think we are going to have competition not just in products, but also in research from Japan, and we have to make sure that we are staying ahead.

Schmitt. In my view, there's been a big misunderstanding of that Japanese scene. People have talked about these MITI (Ministry of International Trade and Industry) programs, where they have these joint programs of MITI and Japanese industries in things like Very Large-Scale Integration, the 5th generation computer, and the like. In fact, those past programs have been the Japanese attempt to make up for the deficiency they have in academic research. I've talked to the directors of Japanese industrial laboratories, and asked them

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Gramm-Rudman and NSF: Fate of Budget Remains Uncertain

Sandra Toye, a veteran of the federal bureaucracy who currently serves as Controller of the National Science Foundation, gave the National Science Board a realistic and gloomy rundown on June 20 on NSF's budget situation in this first full year of the Gramm-Rudman process. Following are excerpts from her remarks, edited by SGR.

Ordinarily at this time, we'd have a sense of where [the budget] process is going. And this year we don't. For several reasons, one, of course, Gramm-Rudman, both in the sense that we might have a sequestration [to meet prescribed deficit-reduction levels] and, secondly, in the sense that even if we don't, it will be because the fear of sequestration has driven the appropriation and income process in the direction that makes it unnecessary.

The second factor is election-year scheduling and politics. I mean that only in the sense that . . . this is a political year, [deficit reduction] is the central issue, and the schedule is foreshortened because everybody wants to go to campaign. So, it means that the possibility for compromise is substantially less than in your usual year. Thus, the likelihood that we will not have any appropriations at all is at least as great as usual, if not worse [in which case, spending at the previous year's level is usually voted].

The third factor for us is the NASA situation arising from the tragedy with Challenger. This hits us 2 ways. First, obviously, at the macro level, NASA is our sister agency in the Science and Technology Function [of the federal budget] in which the broad

cuts of the budget are made. So, the decisions that are made here impact on us. We also are in the same appropriations omnibus with NASA. Some of you on the Board may not know this oddity—appropriations are done in bunches. And they are not very logical bunches. We [NSF] are in with the Department of Housing and Urban Development, the Veterans Administration, the American Battle Monuments Commission, and NASA. So, we get hit at both levels, with the issue of what happens at NASA . . .

If, when the Gramm-Rudman "snapshot" of the economy is made in August, we do not have appropriations, the base [from which the fiscal 1987 budget will be calculated] will be 1986. So, agencies like NSF that were in for an increase will fare even worse. Agencies that were in to get clobbered anyway in 1987 might welcome this kind of scenario . . .

Normally, you would have some feel from the way the Office of Management and Budget and the Office of Science and Technology Policy felt about our budget; they have been extremely supportive, and the Administration has gone down the line with us. And the tone of [Congressional] hearings [has been favorable]. I think [Board Chairman] Dr. [Roland] Schmitt and [Board Member] Dr. [Mary] Good . . . could say, "I've never heard a set of hearings that went so well, that were so laudatory of our stewardship and of the things we are about."

But in the end, if . . . sequestration happens, it's going to have nothing to do with value judgments about us. It's just going to be a fallout of the situation. And that's frustrating for those of us who think if we just make our case a little better, we can win.

... Defense, Space Goals Strain Academic Base

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what they get out of those programs. And they described to me exactly the same things I expect to get out of academic research. I believe a lot of people misunderstand the phenomenon that has been occurring in Japan. They think they see in MITI programs big, focused, applied research programs and that we ought to go and do likewise. I think it's just a misunderstanding.

Q. Where must your missionary efforts be applied to get more federal support for basic research in universities?

Bloch. We've got to convince, obviously, the Administration, and that includes OMB, the President himself—I don't think he needs much convincing, based on his actions in the past—and last, but not least, Congress. By Congress, I don't just mean the committees we're dealing with, but a much broader range of people in Congress, a much bigger number, from different parts of the country and from both sides of the aisle.

Won't Judge Emphasis on Defense R&D

Q. With the budget restraints that are a political reality, is it wise to put 73 or 74 percent of all federal R&D money into national security?

Schmitt. That's not a question that's appropriate for me to answer, where I sit, or for Erich to answer. Those decisions are made by our elected political representatives. What we can say, however, is that if you're going to do that, you'd better also make sure you've got adequate resources to succeed in them. And that's the thing that is not true today.

Q. It was argued at the Board meeting that NSF has to be more aggressive, more expansionist. Have you thought about putting, perhaps, the basic research program of DOD into NSF?

Bloch. No. Obviously, I think we can do a better job than some of the other agencies can, if given an opportunity. But I wouldn't be unhappy if that balance were corrected and many of the other agencies would be part of that increase. We're talking about a common problem—that universities are not supported to the extent they should be. How we get there is important, but the most important thing is the end goal.

Schmitt. There is no turf battle between NSF, the National Science Board and other government agencies that wish to strongly support academic research. What we have speculatively commented on in the past is that if NSF could help any of those agencies in managing those funds, their own funds, we would be happy to do so.

Q. Would you accept their help in managing your funds?

Schmitt. If they had the capability to manage it better—yes. The only argument here is that NSF does know how to manage funds going to academic research very effectively and very well.

Bloch. In fact, some of the agencies and offices are not set up really to go through peer review. They need the help of other organizations.

Q. DOD and DOE claim to use peer review.

Bloch. Where does SDI get its peer review from? They have to go to the Navy or the Army or the Air Force. My point is they don't have their own peer-review setup. We're set up for it on a grand scale. I think we have some prestige out there, and we have shown that the quality that comes out of it is very good.

Q. So, you would be prepared, let's say, to provide peer-review services for SDI's Innovative Science and Technology Office?

Bloch. I'll put it differently. If SDI would put more money into basic research than it does today, and if that basic research were open research, and if it has a bearing on what we are doing, then I wouldn't be opposed to joint funding between the 2 agencies. And we would do the administration—by that I mean the peer review. I wouldn't be opposed to that. In fact, I proposed that.

Q. With Ionson's office, [James Ionson, Director of the SDI Innovative Science and Technology Office]?

Bloch. Yes, with Ionson's office.

The Answer from SDI

Q. How did they respond?

Bloch. Well, since nothing has happened, you know how they responded.

Q. Ionson says he has a peer-review process (SGR Vol. XVI, No. 9).

Bloch. He does. He's using a surrogate for it, namely, the Office of Naval Research and some of the other defense agencies. He's not set up for it. By the way, we don't want to be in a position where we review his classified proposals. That's not what I'm talking about, but [I'm talking about] his support of basic research.

Schmitt. But this isn't the major thrust of this whole effort [to increase basic-research support] right now. It's a proposition that was made where NSF could do something if [other agencies] so desired. You got to go back to the fundamentals that we talked about earlier, the fundamental objectives.

Q. The NSF directorates have listed a variety of new programs and expanded ones that they say are desirable. How will you decide among them?

Schmitt. Between now and August, Mr. Bloch is going to have to sort them out and come back to the Board. If one of them has got to be selected, it is something in the area of undergraduate science and engineering education. We've just conducted a major study of that, got a lot of effort and thought put into it, some good insights, and my only hope is it will be a fairly

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... Other Needs Come Ahead of SSC Accelerator

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innovative kind of a program that will be brought forth.

Bloch. Here we talk about [budget plans for fiscal] 1988. We don't even know what 1987 [now under consideration in Congress] looks like.

Q. Dr. Schmitt, you recently expressed some qualified reservations about the wisdom of going ahead with the Superconducting Super Collider (SSC) in the present budgetary situation (SGR Vol. XVI, No. 2).

Schmitt. The SSC is a desirable thing to do. But the reservations I expressed were, how are we, as a nation, going to work our way through the other serious problems that we've just been talking about here. And the final answer to that is going to depend upon how the spending on the SSC and the spending on these needs that Erich and I have been talking about come to grips with one another. If they stay [in] separate [budget] channels, as the SSC advocates wish to happen—and are entirely incremental funds—then fine. I just expressed some doubt that in the end, that could be true.

Q. They're not in separate channels.

Schmitt. That's why I said I doubt that they could be. The point is that the people who are strongly behind the SSC quite correctly say, look, the nation should decide to do this purely on incremental funds. My doubts are that, in fact, that could really occur.

More Urgent Problems

Q. Does that add up to saying we should set the SSC aside temporarily and attend to more urgent matters?

Schmitt. I haven't really personally addressed how I would [rate] all the priorities and how that would be phased. But I would certainly put some of the problems we've been talking about now as higher priority than that [the SSC] at the present time. It pains me say that, but I would have to come to that conclusion.

Q. What would you say comes ahead of the SSC?

Schmitt. Getting at the faculty shortages, the [research] facilities problems, instruments—all the problems of academic research that we've been talking about.

Q. How about the space station? That's \$8 to \$12 billion.

Schmitt. Yeah. I don't think it's useful to tee up these things as opposed to one another. The point that I made earlier, which I'll repeat now, is, if the nation decides it wants to do those things, then it has to face up to the fact that it needs the human and research inputs to those undertakings. And it doesn't make sense to undertake them and not put what is needed into the front end of them. If you're going to make a certain choice, you have to realize the implications of that choice and act to succeed in the whole spectrum of activities required.

And the academic research and the people it turns out are absolutely needed if you're going to succeed with the space station and SDI and, especially from my point of view, industrial competitiveness.

Q. Dr. Schmitt, you seem to be suggesting that there's some kind of dangerous incoherence in the management of scientific and technical resources in this country; that we're going ahead with the space station, and possibly with the SSC and a number of other grand ventures, but we're not supporting the universities that train the people who will be needed. That's a serious indictment you're making.

"Rephrased My Position"

Schmitt. You have rephrased my position in a rather colorful way.

Q. NSF doesn't have responsibility for the SSC or the space station.

Schmitt. That's right. I'm addressing the implications of those for academic research and engineering.

Q. The Foundation and the Board have statutory authority for generally promoting science and engineering. [The NSF Act states that the "Board and the Director shall recommend and encourage the pursuit of national policies for the promotion of research and education in science and engineering."]

Schmitt. In principle, yes. And I think we're exercising that charge in what we're doing. Those laws were written—they have been amended—at a time before some of the present science structure was put in place, before the OSTP (White House Office of Science and Technology Policy) was put in place and so forth. So, as far as I'm concerned, the Board ought to act responsibly and vigorously and effectively and well, but not try to go out and capture a lot of ground that it wouldn't be productive to try to do at the present time. I think we have our hands full with NSF.

NSF Data Bases Goes On-Line

The National Science Foundation's Division of Science Resources Studies is now dishing out some of its vast lode of data via personal computer through a newly established Remote Bulletin Board System. To hook up: 202/634-1764; parameters are 300 or 1200 baud, 8 data bits, 1 stop bit. For information and help: 202/634-4636.

Data available through the electronic bulletin board include NSF's annual reports on federal funds for Research & Development, science and engineering expenditures in universities, graduate enrollments, and international comparisons of R&D.

NTIS "Privatization" Pushed by Budget Office

The government's giant role as vendor of research documents and assorted technical data is under review again as the Office of Management and Budget considers "privatizing" all or some of the operations of the National Technical Information Service (NTIS).

Options for the fate of NTIS, whose sales totaled \$22 million last year, were published in the April 28 *Federal Register*, and are to be discussed July 30 at a meeting in Washington sponsored by the Department of Commerce, NTIS' parent agency. The NTIS issue has spawned strong feelings among Reagan Administration free-marketeers, who say the government should get out of the business; the private information industry, which says it can do it better, and proponents of the status quo, who say NTIS fills a unique and necessary public role.

Proposals for changing the status of NTIS have been seriously raised without much effect off and on over the past decade, but according to NTIS staff members, OMB is now pushing for change harder than ever. The prospects for substantial changes are considered to be likelier than ever before. An often-mentioned possibility for reorganization calls for spinning off NTIS's sales and distribution operations to the private sector, with the collection and archival functions assigned to a non-profit government corporation.

Many of the 130-odd comments generated by the *Federal Register* notice argued for some private-sector involvement. But many, including comments from the Special Libraries Association, expressed concerns that NTIS's unmatched document collections might be seriously damaged if industry is allowed to take them over and then finds the operations are unprofitable.

The collections mainly date onwards from 1946 and include over 1.6 million titles. Regular contributions come from some 2000 sources in federal government, state and local agencies, plus government contractors and various foreign organizations. No research report is too obscure or outdated to get into or remain in the NTIS collection. It's all easily available upon request and for a modest fee. Some efforts have been made to complicate access for unfriendly nations, but openness and accessibility are proud features of the NTIS operation, and the security measures have been very modest.

Critics of the present setup contend that, spurred by Congressional insistence that revenues should meet costs, NTIS has expanded into areas of business where it doesn't belong. For example, it publishes various indexes and abstracts, and it increasingly provides data in machine-readable form. Representatives of private industry say that's unfair competition and that they could do it better.

Some of the loudest calls for more private-sector involvement on the sales and distribution side have come from the Information Industry Association (IIA)—the trade group of the companies that stand to gain the most if NTIS gets broken up. IIA complains that NTIS maintains a lot of information that was not produced with federal funds and that NTIS isn't equipped to process data to make it more usable—and profitable. The private association says the government agency is stifling private initiative.

NTIS' defenders say that the authority and visibility of government are needed to ensure the completeness of collections. Federal agencies are not legally required to submit copies of their research reports to NTIS, but they do so anyway, and NTIS has thereby gained high marks for coverage. It is arguable whether a private company would have the same success with the huge outpouring of papers that now easily flow into the NTIS system.

Even the IIA concedes that there would be at least a short-term disruption if the collection role were turned over to private firms. The Commerce Department appears to be sensitive to those concerns and is said to be disinclined to take that risk. As a result, it is now thought likely that Commerce will back a system under which collection and archiving would remain a direct government function or be assigned to a government corporation.

The real problem for a capitalist version of NTIS may be the sparseness of the market for NTIS materials. The average number of sales for an NTIS document is less than 10; many are filed away in NTIS' archives, never to be seen again. IIA believes that new technologies for information storage and retrieval, such as optical disks, can wring profits from even such minuscule markets; others are skeptical.

The Commerce Department aims to make final recommendations on the fate of NTIS by September. Any major changes will probably be announced in the budget that the President sends to Congress next January.

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Foreign Exclusions from US Meetings Protested

Washington-based science attaches of several friendly nations say that restrictions on foreign attendance at unclassified scientific and technical meetings in the US have become a chronic problem for scientists in their countries. Meetings where "US Citizens Only" rules have prevailed at some sessions include a symposium in April of the Society for the Advancement of Materials and Processing Engineering and a conference last January of the American Ceramics Society.

The restrictions reflect the "chilling effect" of the Reagan Administration's security mania, according to Robert L. Park, who monitors Washington affairs for the American Physical Society (APS). "Some people at DOD are actually upset about these meetings being closed off," Park told SGR. "But the societies figure it's less trouble to keep out foreigners than it is to risk a security hassle."

The closings, often involving gatherings that have traditionally been open to international attendance, have been occurring quietly, in contrast to several highly publicized blowups a few years ago. The main differences now are that the professional societies are doing the dirty work themselves and press attention, usually fickle, has turned away from the subject.

Since there's no central point for collecting data on restricted meetings, it is difficult to assess the extent of the problem. And the nature of the restrictions appears to vary from meeting to meeting. One science attache who attended a partially restricted meeting told SGR that he was admitted to a closed session simply by showing a US driver's license. The attache of another country made it plain that scientists back home were furious at being banned from sessions in the US, particularly in cases of meetings billed as "international" gatherings.

According to an incomplete list prepared by the APS, restrictions on foreign attendance were imposed on a meeting in January of the Society of Manufacturing Engineers, where attendees were required to provide proof of US citizenship. The same restrictions were also applied to a course on metal matrix composites at UCLA in June 1984. At an October

Anti-SDI Petition on Target

Congress is in the process of whacking huge sums from the Administration's requests for the Strategic Defense Initiative for next year—and the scientific community, which has been barraging Capitol Hill with anti-SDI petitions, deserves much of the credit for the Congressional turnout. The following is from a speech June 19 by Senator J. Bennett Johnston (D-La.), concerning an "Open Letter to Congress" signed by 1600 scientists expressing reservations about the technical feasibility, costs, and strategic effects of SDI.

The 1600 signatories . . . have a very special credibility on the subject of Star Wars. These are scientists from the major weapons laboratories and high-technology centers across the nation, such as Los Alamos, Livermore, Lincoln Lab, Jet Propulsion Laboratory, Bell Labs, Sandia, Argonne, Mitre, Raytheon, and Boeing. These are the same government and industrial laboratories who have created the technology upon which our national defense depends. Many signatories are current or former directors of these labs . . .

As a US Senator, I do not think I am telling any closely held secrets when I say that the Star Wars program is a difficult subject matter for my colleagues and me. The vocabulary is daunting enough—words like "smart rocks," "rubber mirrors," and "electromagnetic rail guns" are mystifying for most Senators. We have to look to the scientists who work in exotic technologies for advice . . .

I commend these 1600 scientists. It would have been much easier for them to sign nothing, to say nothing, to do nothing. But they obviously care about our national security, about real security and the sensible use of our defense resources.

1984 meeting of the American Astronautical Society, a secret briefing on the Strategic Defense Initiative was restricted to US citizens with security clearances.

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